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10/535,555	05/18/2005	Charles Razzell	US02 0453 US	7474

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EXAMINER	
CHOW, CHARLES CHIANG	
ART UNIT	PAPER NUMBER
2618	

NOTIFICATION DATE	DELIVERY MODE
11/13/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/535,555	RAZZELL, CHARLES	
	Examiner	Art Unit	
	CHARLES CHOW	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-20* is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. This office action is for amendment received on 10/10/2008.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinckley [US 5,519,890], Smith et al. [US 6,512,472 B1] and Signell et al. [US 2001/0050,966 A1].

For claim 1, Pinckley teaches a method [Fig. 1 to Fig. 4 & its description in the specification] of operating a radio receiver [broadband receiver 10], having an analog portion coupled to an A/D converter [A/D 22 in 14, Fig. 2], and

the A/D converter coupled to a digital signal processing portion [A/D 22 in 14 coupled to DSP 15/16, Fig. 1/Fig. 2],

digital signal processing portion to generate narrow band signal from a wideband signal received from the A/D converter [the DSP processing the narrow band signals 30-33 from the digital samples derived from broad band signal to A/D 22, Fig. 3, col. 2, lines 43-58] and to recover data from the narrow band signal [to decode the narrow band signals 30-33 in col. 2, lines 50-55], the method comprising

comparing the wideband signal power estimate to a wideband signal power threshold

[comparing the carrier amplitudes in the wideband width having signals 30-33 to the threshold 35, Fig. 3, col. 2, lines 50-66]; and

responsive to comparing the wideband signal power estimate to a wideband signal power threshold [the determining of the result for whether exceeding the threshold, col. 2,

line 59 to col. 3, line 2], preventing the total signal power reaching the A/D converter from exceeding a maximum allowable input amplitude [to attenuate the offending carrier amplitude with tunable notch filter, col. 3, lines 31-43, Fig. 2].

Pinckley fails to teach the wideband total signal power between A/D and digital signal processing.

Smith teaches the obtaining a wideband signal power estimate of total signal power reaching A/D converter by measuring a signal between the A/D converter and the digital signal processing portion

[the compute/control 116 measures signal power level of the samples from ADC 114, for the plural, wide, frequency bands, by adjusting the cutoff frequency of the filters 106/108 & controlling the gain of amplifier 112 in front of the ADC 114, to the desired level, to avoid the signal level clipping, col. 4, line 31 to col. 5, line 8 & abstract], in order to obtain the wide band signal power after A/D converter output. Therefore, one of ordinary skill in the art at the time the invention was made would be obviously anxious to improve Pinckly with Smith's teachings above, such that the wide band signal power could be measured at the A/D converter output.

Pinckly in view of Smith fail to teach the digital filtering to generate narrow band signal from a wideband signal.

Signell et al. [Signell] teaches the digital signal processing portion using digital filtering to generate narrow band signal from a wideband signal received from the A/D converter

[Fig. 8, the Cmplx band pass digital filter for deriving 30 KHz narrow band signal from 30 MHz wideband signal, paragraph 0070; wideband signal to A/D in paragraph 0068], in order to obtain the narrow band signal from digital filtering. Therefore, one of ordinary skill in the art at the time the invention was made would be obviously anxious to improve Pinckley,

Smith with Signell's teachings, such that a narrow band signal could be obtained by the digital filtering of the wideband signal.

For claim 2, Pinckley teaches the estimate of the wideband signal power reaching the A/D converter 22 [comparing carrier amplitudes in the wideband width having signals 30-33 to the threshold 35, Fig. 3, col. 2, lines 50-66], from exceeding a maximum allowable input [to attenuate the offending carrier amplitude with notch filter, col. 3, lines 31-43, Fig. 2], comprises

determining that the wide-band signal power estimate is greater than a predetermined first threshold [comparing the determined carrier amplitudes in the wideband width having signals 30-33 to the threshold 35, Fig. 3, col. 2, lines 50-66], and

Pinckley fails to teach the reducing the gain.

Smith teaches responsive thereto, reducing the gain of at least one amplifier coupled to an input terminal of the A/D converter [] and

responsive thereto, reducing the gain of at least one amplifier coupled to an input terminal of the A/D converter [varying the gain of 112, Fig. 1 & col. 4, line 67 to col. 5, line 8; to prevent the signal level clipping at the input of the ADC across each frequency bands, col. 7, lines 25-30; the wide band power in col. 5, lines 1-8; the P_A threshold in col. 8, line 46 to col. 9, line 3]. Therefore, one of ordinary skill in the art at the time the invention was made would be obviously anxious to modify Pinckley, Signell with Smith's teachings above, such that the wideband signal power could be reduced by changing the amplifier gain.

3. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinckley in view of Smith, Signell, as applied to claim 2 above, and further in view of Abbey [US 6,151,354] and Van Bezooijen et al. [US 7,233,631 B2].

For claim 3, Pinckley, Smith, Signell fail to teach the sigma-delta converter.

Abbey teaches the sigma-delta A/D converter that includes a decimation and filtering processing chain [the sigma-delta A/D 106 in Fig. 5, the decimation filer 108, the low pass filter 110 & the average peak detection 121, all together, for the claimed sigma-delta A/d converter]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pinckley, Smith, Signell with Abbey's teachings above, such that the received signal could be processed with digital decimation, filtering.

Smith teaches the estimation of wideband total signal power above in claim 1. Pinckley, Smith, Signell, Abbey fail to teach the estimating of a signal power from an intermediate point in the decimation and filter processing chain.

Van Bezooijen et al. [Van Bezooijen] teaches the signal power estimate is obtained by taking a signal from an intermediate point in the decimation and filter processing chain

[the amplitude detection 19 is positioned between decimation DFI and filter 17-1, in the only Figure & its description in sepecification]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pinckley, Smith, Signell, Abbey with Van Bezooijen's teachings above, such that the Abbey's average peak detection 110 can be also moved to the position in between the decimation 108 & low pass filter 110, in order to measure the power level of a wide band signal.

For claim 4, Pinckley, Smith, Signell, Abbey, Van Bezooijen fail to teach the detecting an in-band signal power greater than a predetermined second threshold.

Smith further teaches the detecting an in-band signal power greater than a predetermined second threshold [the Po of the desired threshold, as the second threshold, col. 7, lines 39-45], and

responsive thereto, reducing the gain of at least one amplifier coupled to an input terminal of the ADC [reducing the gain in col. 7, lines 9-30; to avoid clipping at the input of ADC 114]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pinckley, Smith, Signell, Abbey, Van Bezooijen with Smith's teachings above, such that the in-band power could be controlled with a threshold.

4. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinckley in view of Smith, Signell, as applied to claim 1 above, and further in view of Shi [US 2005/0079,842 A1].

For claim 5, Pinckley, Smith, Signell fail to teach the placing the first variable gain amplifier in a low gain state if a wide-band signal power is greater than a first threshold.

Shi teaches the method for placing the first variable gain amplifier [LNA 210] in a low gain state [reducing the gain in step 604] if a wide-band signal power is greater than a first threshold [step 602, the wide band Rssi_A is greater than threshold_A], to avoid the intermodulation interference. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Pinckley, Smith, Signell with Shi's detecting of wide band signal power, such that the receiver could avoid the intermodulation interference.

For claim 6, Pinckley, Smith, Signell fail to teach the wide-band signal power is less than a first threshold, together with the narrow band signal power is greater than a second threshold.

Shi teaches the wherein the radio receiver [200] includes a first variable gain amplifier [LNA 210], and the method further comprises

determining that a wide-band signal power is less than a first threshold [step 602, wide power Rssi_A is less than thres_A, then, go to step 608]; and placing the first variable gain amplifier in a low gain state if a narrow-band signal power is greater than a second threshold [reducing the gain of LNA at 616 after narrow power Rssi_B is greater than thres_C at 614]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Pinckley, Smith, Signell with Shi's teaching, such that the first variable gain amplifier could be reduced based on the detected narrow band power level.

5. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinckley in view of Smith, Signell, Shi, as applied to claim 6 above, and further in view of Walker et al. [US 2005/0208,919 A1].

For claim 7, Pinckley, Smith, Signell fail to teach the low gain state of the first amplifier.

Shi teaches the wherein the first variable gain amplifier is placed in a low gain state if the narrow-band power is greater than the second threshold [the narrow Rssi_B is greater than thres_C at step 612, then, to reduce the gain of LNA, step 616]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve Pinckley, Smith, Signell with Shi's teachings above, such that gain could be controlled by a threshold.

Pinckly, Smith, Signell, Shi fail to teach the hysteresis value for the threshold.

Walker teaches the hysteresis value for the threshold [the hysteresis for the gain stepping in Fig. 4C, for the gain rising & gain falling, low gain in table 1, paragraph 0078-0080], for reliable controlling the gain changes with hysteresis. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to

upgrade Pinckley, Smith, Signell, Shi with Walker's hysteresis, in order to reliably controlling the gain changes with hysteresis.

For claim 8, Pinckley, Smith, Signell fail to teach the high gain state if the narrow-band power is less than the second threshold.

Shi teaches the wherein the first variable gain amplifier [LNA] is placed in a high gain state [step 706] if the narrow-band power is less than the second threshold [the narrow Rssi_B is less than thres_C at step 612, then, to step 702, to increase the gain of LNA at step 706]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve Pinckley, Smith, Signell with Shi's teachings above, such that gain could be controlled by a threshold.

Pinckly, Smith, Signell, Shi fail to teach the hysteresis for threshold.

Walker teaches the hysteresis value for the threshold [the hysteresis for the gain stepping in Fig. 4C, for the gain rising & gain falling, low gain in table 1, paragraph 0078-0080]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Pinckley, Smith, Signell, Shi with Walker's hysteresis, in order to reliably controlling the gain changes with hysteresis.

For claim 9, Pinckley, Smith, Signell & Shi fail to teach the same hysteresis value.

Walker teaches the wherein the first hysteresis value and the second hysteresis value are the same [the same hysteresis value, from L1-Fall going towards L1-Rise or from L1-Rise going towards L1-Fall, in Fig. 4C for raising the gain or reducing the gain]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Pinckley, Smith, Signell, Shi with Walker's hysteresis, in order to reliably controlling the gain changes with hysteresis.

Allowable Subject Matter

6. The following is an examiner's statement of reasons for allowance:

Claims 10-20 are allowable over the prior art of record. The prior arts fail to teach the allowable features, singly, particularly, or in combination or rendering obviousness.

Applicant has amended independent claims 1, 10, 12, 15 with allowable limitations, such as underlined in claim 1 in below :

Claim 10, (Currently Amended) A method of preventing saturation of a sigma-delta A/D converter in a radio receiver having digital channel selectivity circuitry for selecting a digital channel and decode data from the selected channel, comprising:

obtaining [[a]] wideband power estimations taken from a digital signal prior to the digital channel selectivity circuit and [[a]] narrow-band power estimations taken from the digital signal after the digital channel selectivity circuit;

reducing an amplifier gain of a first one of a plurality of amplifiers [[if]] in response to one of the wide-band power estimations [[is]] being greater than a first predetermined value; and

[[if]] in response to another of the wide-band power estimations [[is]] not being greater than the first predetermined value, reducing the gain of at least one of the plurality of amplifiers [[if]] in response to one of the narrow-band power estimations [[is]] being greater than a second predetermined value.

The dependent claims are also allowable due to their dependency upon the allowable independent claims above and the having additional claimed features.

The closest prior art, **Smith et al. [US 6,512,472 B1]**, teaches the ADC 114 coupled to digital processing portion, direct down DDC 118 & demodulator 120, the controller 116 measures signal power level of the samples from ADC 114, for the plural, wide, frequency bands, by adjusting the cutoff frequency of the filters 106/108 & controlling the gain of amplifier 112 in front of the ADC 114, to avoid the signal level clipping, col. 4, line 31 to col. 5, line 8 & abstract], but fails to teach the above allowable limitations.

Pakravan et al. [US 6,259,391 B1] teaches the total power estimator 42, at the output of A/D converter 34, measures the total power at the input of the A/D 34, for controlling the gain of AGC 23, to prevent the maximum signal level inputting to the A/D 34, & to adjust the

amplitude of the received signal via AGC 23 [Fig. 5 & col. 8, line 49 to col. 9, line 21], but fails to teach the above allowable limitations.

Other prior arts in below are also considered, but they fail to teach the above allowable features.

Abbey [US 6,151,354] teaches the sigma-delta A/D converter that includes a decimation and filtering processing chain [the sigma-delta A/D 106 in Fig. 5, the decimation filer 108, the low pass filter 110 & the average peak detection 121, all together, for the claimed sigma-delta A/d converter].

Van Bezooijen et al. [US 7,233,631 B2] teaches the DC level offset detection at 15-1 is positioned in between DFI and filter 17-1, & having an amplitude detection 19 [in the single Figure & its corresponding description].

Takatz [US 7,046,749 B2] teaches a method of operating a radio receiver [Fig. 1, Fig. 5A-5C & its description in specification, claims 1, 6-7] having a plurality of serially coupled variable gain amplifiers [VGA1 to VGA3, Fig. 5A], and a digital portion [15] that performs, at least partially, a frequency selectivity function [digital filter 17-I, 17-Q, Fig. 1, 160-I/160q in Fig, 5B & its description in specification].

Other prior arts are also considered. They are: **Masumoto et al. [US 2003/0027,538 A1], Rimini et al [US 6,836,647 B2], Groe [US 7,054,605 B1], Parssinen et al. [US 2003/0078,007 A1], Yamanaka et al [US 2001/0053,680 A1], Gu [US 6,950,641 B2], Hughes [US 2003/0207,674 A1], Ciccarelli et al. [US 6,498,926 B1], Husted et al. [US 2003/0012,313 A1].**

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the

issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Response to Argument

7. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant amendment based on the no teachings for the digital signal processing portion using digital filtering to generate a narrow-band signal from wideband signal receive from the A/D converter and to recover data from the narrow band signal

Pinckley [US 5,519,890] teaches the digital signal processing portion to generate narrow band signal from a wideband signal received from the A/D converter

[the DSP processing the narrow band signals 30-33 from the digital samples derived from broad band signal to A/D 22, Fig. 3, col. 2, lines 43-58] and to recover data from the narrow band signal [to decode the narrow band signals 30-33 in col. 2, lines 50-55],

the comparing the wideband signal power estimate to a wideband signal power threshold [comparing the carrier amplitudes in the wideband width having signals 30-33 to the threshold 35, Fig. 3, col. 2, lines 50-66].

Signell et al. [US 2001/0050,966 A1] teaches the digital signal processing portion using digital filtering to generate narrow band signal from a wideband signal received from the A/D converter

[In Fig. 8, the Cmplx band pass digital filter for extracting 30 KHz narrow band signal from the 30 MHz wideband signal, paragraph 0070; wideband signal to A/D in paragraph 0068].

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office

action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles C. Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Charles Chow/
Examiner, Art Unit 2618
October 27, 2008.

/Duc Nguyen/

Supervisory Patent Examiner, Art Unit 2618